









A lockable cover especially for use in the surface of a road or footpath.

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Inventor: RAATJES EGBERT SIJBOLT
Applicant: RAATJES EGBERTUS SIJBOLT
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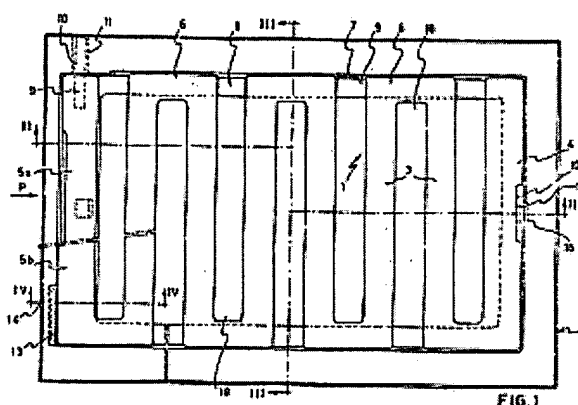
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Abstract of EP0023380

The cap (1,20) grid cap or the cap portions of a cover like an inspection or water discharge well in the surface of a road or foot-path comprises at least one such slot-like opening (18, 31) extending from its periphery that when applying an external force to a peripheral portion of the one cap portion, a resilient movement from the one cap portion with respect to the other one occurs in the plane of the cover.



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- (73) Proprietor: **Raatjes, Egbert Sijbolt**
Sparrenlaan 9
NL-3768 BG Soest (NL)
(72) Inventor: **Raatjes, Egbert Sijbolt**
Sparrenlaan 9
NL-3768 BG Soest (NL)
(74) Representative: **Kooy, Leendert Willem**
OCTROOIBUREAU VRISENDORP & GADE P.O.
Box 266
NL-2501 AW The Hague (NL)

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A lockable cover especially for use in the surface of a road or footpath

The invention relates to a lockable cover, especially for use in the surface of a road or footpath, comprising a one-piece closure and a frame.

Such a cover is known from US—A—2009132 and comprises a closure having a number of arcuate pads, one of these pads being provided with a safety cam of wedge shape which is loaded by a spring to lock the closure within the frame. The closure can be unlocked by means of a simple lever and then be removed, which is necessary for cleaning the well with regular intervals.

The object of the invention is to obviate the need to provide a spring and a plunger without renouncing the possibility to lock the closure.

According to the invention this is reached by the characteristic that the closure has at least one slot-like through opening which extends from one peripheral region to an opposite peripheral region to divide the closure into first and second portions, the opening at one end forming a gap in the periphery and at the other end stopping short of the periphery to provide a bridge, the arrangement being such that a force applied to the closure at its periphery, in the plane of the closure and perpendicularly to said slot-like opening causes resilient relative movement of said first and second portions about said bridge to release the closure from the frame.

If more than one opening is provided, these openings can either be positioned in a sinus-like configuration or in a comb-like one.

The slot-like opening or openings enable such a resilient movement between portions perpendicular to the slot-like opening or openings in the plane of the closure. In preferred embodiments of the cover according to the invention, the closure has at one side cams or pins and at the side facing away from the side of the cams or pins a safety cam engaging beneath the adjacent side of the frame in a locking recess. The safety cam can thus be released for cleaning purposes by a specially adapted tool which has to be positioned in the space between the frame and the closure.

Opening or removing the closure by unauthorized persons without above said tool is practically impossible. In order to enable the above said resilient movements of the closure or its portions, and to counteract weakening of the closure as the result of the local failure of material, in a cover according to the invention, the closure consists of a suitable material, as for instance cast iron with spheroidal graphite or steel. Such materials provide the necessary resilience to the closure for releasing the safety cam.

The invention will further be elucidated on

Fig. 1 is a plan view of a cover for use in the surface of a road.

Fig. 2 is a longitudinal section along line II—II of Fig. 1.

Fig. 3 is a cross section along line III—III of Fig. 1.

Fig. 4 is a partial longitudinal section along line IV—IV of Fig. 1.

Fig. 5 is a view according to the arrow P in Fig. 1.

Fig. 6 is a plan view of a cover for use in a footpath.

Fig. 7 is a cross section along line VII—VII of Fig. 6, and

the Fig. 8—10 are a plan view and cross sections respectively according to the lines IX—IX and X—X of a cover having a closure of round configuration.

The cover of Figs. 1—5 comprises an inlet grid 1 and a frame 2 of rectangular shape for instance of a gully for use at the side of a road.

The closure 1 comprises a number of equal grid bars 3, having substantially a rectangular cross section extending downwardly in flange shape increasing to the centre (vide Fig. 3), whereas both outermost grid bars 4 (Fig. 2) and 5a, 5b respectively (Fig. 1, 2 and 4) are somewhat different as far as the support thereof is concerned.

The grid bars usually rest at their ends with a bridge 6 interconnecting said bars (Fig. 2 and 3) on a support surface 8 extending inwardly from an enclosure surface 7 (Fig. 2—4) of the frame 2.

The grid bar 4 at the one end of the grid (Fig. 2) is substantially beam-like and rests over the complete length thereof on the support surface, at this side of the frame 2. For clearness sake the other end of the closure is represented in Fig. 1 in two different embodiments.

The closure 1 of the one embodiment is pivotably secured to the frame 2 around a horizontal axis 9 (Fig. 1, 2, 5) by means of two pivot pins 10 secured to the bar 5a of the grid end (one of which is shown in Fig. 1). The pins are received in such a broad bore 11 (Fig. 1 and 5) of the frame, that the grid bar 5a, which has at the central portion a substantially beam-like cross-section with rounded lower side 12 and the end thereof merging into the bridge 6, can rest on the support surface 8 of the frame 2. The closure 1 rests in the closed position with three of its sides on the support surface 8 of the frame.

The closure can also removably be embodied, in which case the grid bar 5b at said end of the closure 1 is provided with two laterally extending plunge cams 13, only one of which being shown in Fig. 1, which engage in a facing broad recess 14 (Fig. 4) of the frame 2. The grid bar 5b has advantageously over the entire length a beam-like cross section, with flat lower side 15, with which the bar 5b is supported by the support surface 8 of said portion of the

frame. The closure is then circumferentially supported by the support surface 8 of the frame.

The central portion of the bar 4 is, at the other end of the closure, provided with a laterally extending locking or safety cam 16, engaging in a recess 17 of the frame 2, so that the closure can rest on the support surface 8 of the frame without being obstructed.

In order to release both embodiments of the closure from the frame 2, when the closure is provided with plunge cams 13, or to open the closure when it is provided with pivot pins 10, the closure is resiliently embodied in the direction perpendicular to the grid bar 5a having the pivot pins 10 or perpendicular to the grid bar 5b having the plunge cams 13.

For that reason the bridges 6 of the closure 1 (see especially Fig. 1 and also Fig. 2—4) are missing at one end of the slots 18 between the adjacent grid bars 3, and between the one end grid bar 4 and the adjacent grid bar 3, and between the other end grid bar 5a or 5b and the adjacent grid bar 3, alternately, so that the closure has a "sinus"-like configuration in plan view and the support surface 8 of the frame between the ends of adjacent grid bars can alternately be seen from above.

If the bridges 6 of the closure are missing at the same side, so that the support surface can be seen along the same edge, one can speak of a "comb"-like configuration.

The end grid bar 4 is in the vicinity of the safety cam 16 (Fig. 1 and 2) provided with a locking recess 19 which is adapted to receive the insertion end of a tool (not shown). By swinging the tool in the vertical longitudinal central plane the closure will be compressed, so that the safety cam 16 moves backwards and out of engagement with the locking recess 17, after which the closure can be rotated upwardly around the pivot pins 10. The closure having the plunge cams 13 at the end grid bar 5b, can also be swung upwardly in relation to the recess 14 and subsequently be removed. This may be necessary for cleaning purposes of the lower structure of the gully.

Removing or opening the closure by unauthorized persons is very difficult without applying the adapted insertion tool.

The second embodiment of the cover which is shown in Fig. 6 and 7, comprises a closure 20 and a frame 21, for use as a head gully in the surface of a footpath, at the side of a road.

The closure 20 is supported with the face 23 extending inwardly from the enclosure face 22 at the peripheral flange edge 24 on the support surface 26 extending inwardly from the enclosure face 25 of the frame 21. At the side 27 of the frame 21 facing the road, where the generally indicated inlet 28 is provided, the enclosure 20 is usually provided with two plunge cams 29, engaging beneath a cam 30 extending at both sides inwardly at said location from the support surface 26 of the frame 21.

The material of the closure 20 is alternately

missing from one side to the other, extending up to in the vicinity of the peripheral edge 24 thereof (Fig. 6) forming openings 31, such that seen from above the closure has a "sinus" like configuration, so that the support surface 26 of the frame 21 can alternately be seen at opposite sides thereof, between adjacent grid bars 20a.

At the centre of the sides of the frame 21, opposite the side thereof having the cams 30 at the inwardly extending peripheral edge flange 32, a prolongation 33 extends downwardly beneath the support surface 26, and is provided with a locking recess 34. At the corresponding side of the closure 20, the peripheral edge 24 thereof is provided with a recess 35 (Fig. 6) and the closure 20 is provided with a downwardly extending locking or safety cam 36, which in the closed position of the closure 20 can engage in the recess 34 of above-said prolongation.

The safety cam 36 can be brought out of engagement with the locking recess 35 under spring action of the closure by means of a tool with fitting insertion end (not shown).

Because on the one hand cast iron with flake graphite is not sufficiently resilient and on the other hand the local failure of material forms a weakening of the closure 1 (Fig. 1) or 20 (Fig. 6), preferably cast iron with spheroidal graphite or steel is used for the closure.

A last embodiment of a closure of a cover is schematically shown in Fig. 8, which closure 20b has in plan view a round configuration which, at two locations at the periphery, is provided with a plunge cam 29a and a safety cam 16a, cooperating with a locking recess 19a and a slot 31a provided in the frame 21. This embodiment has only one slot-like opening 37 so that the closure 20b is resiliently embodied in the direction perpendicular to both portions of the closure which are connected by the bridge 38.

Claims

1. A lockable cover, especially for use in the surface of a road or footpath, comprising a one-piece closure (1, 20, 20b) and a frame (2, 21), characterized in that the closure has at least one slot-like through opening (18, 31, 37) which extends from one peripheral region to an opposite peripheral region to divide the closure into first and second portions, the opening (18, 31, 37) at one end forming a gap in the periphery and at the other end stopping short of the periphery to provide a bridge (6, 38), the arrangement being such that a force applied to the closure at its periphery, in the plane of the closure and perpendicularly to said slot-like opening causes resilient relative movement of said first and second portions about said bridge to release the closure from the frame.

2. A cover according to claim 1, characterized in that the openings (18, 31) are positioned in a sinus-like configuration.

3. A cover according to claim 1, characterized in that the openings (18, 31) are positioned in a comb-like configuration.

4. A cover according to any of the claims 1 to 3, with at one side one or more plunge cams (13) or two pivot pins (10), characterized in that the closure at the side facing away from the side of the cams or pins, at a suitable location is provided with one or more safety cam(s) (16, 36) engaging beneath the adjacent side of the frame and with a locking recess (17, 34).

5. A cover according to any of the claims 1 to 4, characterized in that the closure is made of cast iron with spheroidal graphite or steel.

Revendications

1. Couverture verrouillable destiné particulièrement à être utilisé dans la surface d'une route ou d'un passage pour piétons, comprenant une fermeture (1, 20, 20b) en une pièce et un cadre (2, 21), caractérisé en ce que la fermeture comporte au moins une ouverture en forme de fente (18, 31, 37) qui s'étend à partir d'une région périphérique jusqu'à une région périphérique opposée pour diviser la fermeture en des première et seconde parties, l'ouverture (18, 31, 37) formant à une extrémité un intervalle dans la périphérie et s'arrêtant à l'autre extrémité près de la périphérie pour former un pont (6, 38), la disposition étant telle qu'une force appliquée à la fermeture à sa périphérie, dans le plan de la fermeture et perpendiculairement à l'ouverture en forme de fente entraîne un mouvement relatif élastique desdites première et seconde parties autour dudit pont pour libérer la fermeture du cadre.

2. Couverture selon la revendication 1, caractérisé en ce que les ouvertures (18, 31) sont positionnées en une configuration sinusoïdale.

3. Couverture selon la revendication 1, caractérisé en ce que les ouvertures (18, 31) sont positionnées en forme de peigne.

4. Couverture selon l'une des revendications 1 à 3, avec sur un côté une ou plusieurs cames à plongeur (13) ou deux goupilles pivots (10), caractérisé en ce que sur le côté opposé au côté des cames ou goupilles, la fermeture comporte dans un endroit approprié, une ou plusieurs cames de sécurité (16, 36) s'engageant au-

dessous du côté adjacent du cadre et avec un logement de verrouillage (17, 34).

5. Couverture selon l'une des revendications 1 à 4, caractérisé en ce que la fermeture est faite en fonte avec du graphite sphéroïdal ou en acier.

Patentansprüche

1. Verriegelbarer Deckel, insbesondere zur Verwendung in Fahrbahn- oder Gehsteigoberflächen bestehend aus einem einteiligen Verschluss (1, 20, 20b) und einem Rahmen (2, 21), dadurch gekennzeichnet, daß der Verschluss zumindest eine schlitzförmige Durchtrittsöffnung (18, 31, 37) aufweist, die sich unter Unterteilung des Verschlusses in erste und zweite Abschnitte von einem Randbereich zu einem gegenüberliegenden Randbereich erstreckt und an einem Ende einen Spalt im Umfang bildet sowie am anderen Ende unter Bildung einer Brücke (6, 38) kurz vor dem Umfang endet, wobei die Anordnung derart ist, daß eine auf den Verschluss an seinem Umfang einwirkende, in der Ebene des Verschlusses sowie senkrecht zur schlitzförmigen Öffnung wirkende Kraft eine elastische Relativbewegung des ersten und zweiten Abschnittes um die Brücke zur Lösung des Verschlusses vom Rahmen bewirkt.

2. Deckel nach Anspruch 1, dadurch gekennzeichnet, daß die Öffnungen (18, 31) in einer sinusförmigen Anordnung angeordnet sind.

3. Deckel nach Anspruch 1, dadurch gekennzeichnet, daß die Öffnungen (18, 31) in einer kammförmigen Anordnung angeordnet sind.

4. Deckel nach einem der Ansprüche 1 bis 3, mit einer oder mehreren versenkten Nasen (13) oder zwei Schwenkzapfen (10) an einer Seite, dadurch gekennzeichnet, daß der Verschluss an der Seite der Nasen oder Schwenkzapfen abgekehrten Seite an passender Stelle mit einer oder mehreren Sicherungsnasen (16, 36) versehen ist, die unter die benachbarte Seite des Rahmens und in eine Verriegelungsaussparung (17, 34) eingreift bzw. eingreifen.

5. Deckel nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß der Verschluss aus Gußeisen mit sphärischem Graphit oder Stahl besteht.

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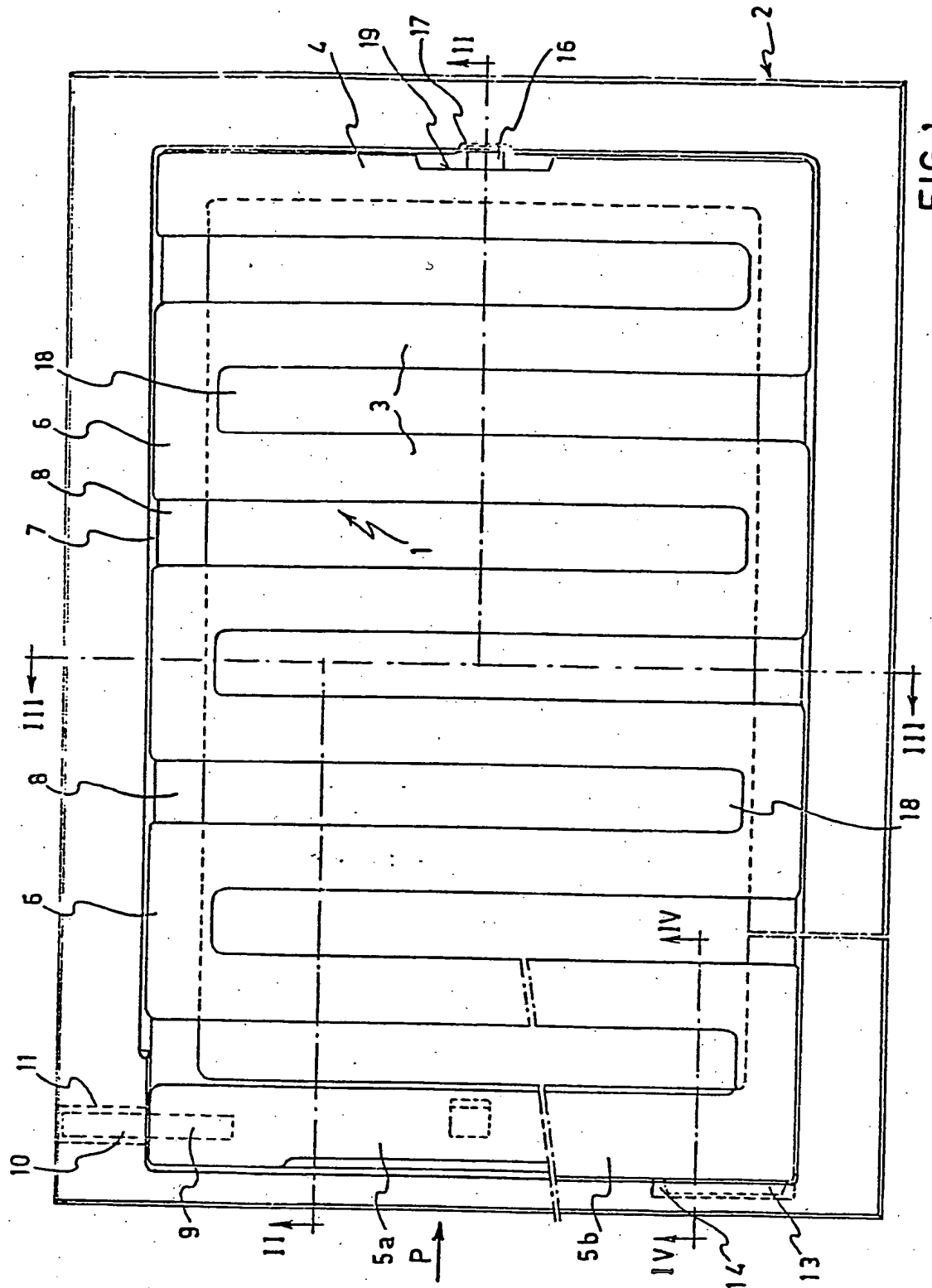


FIG.1

FIG.2

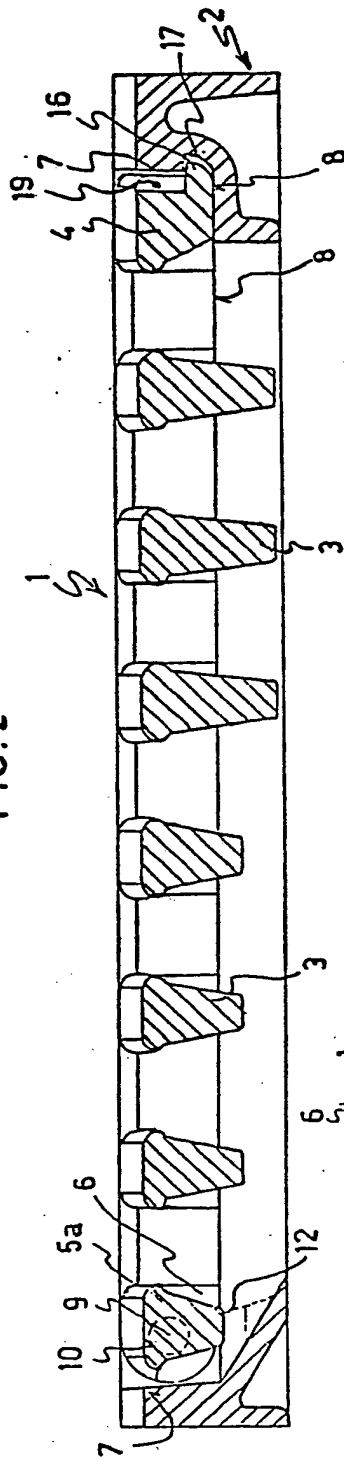


FIG.4

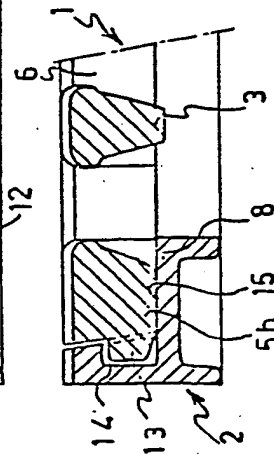


FIG. 3

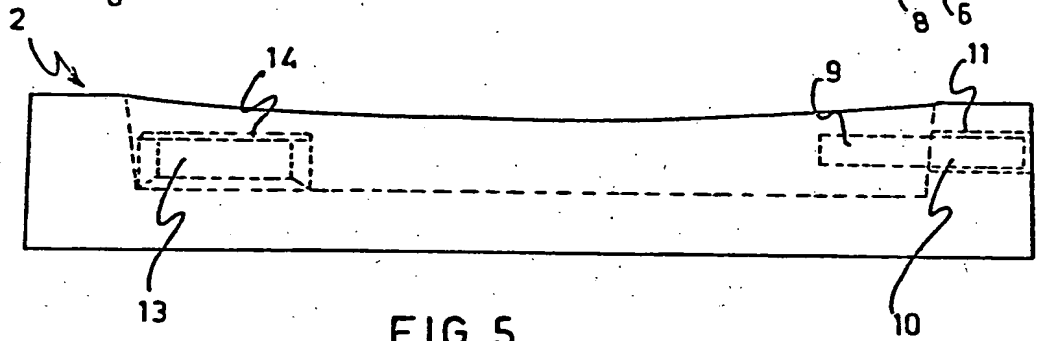
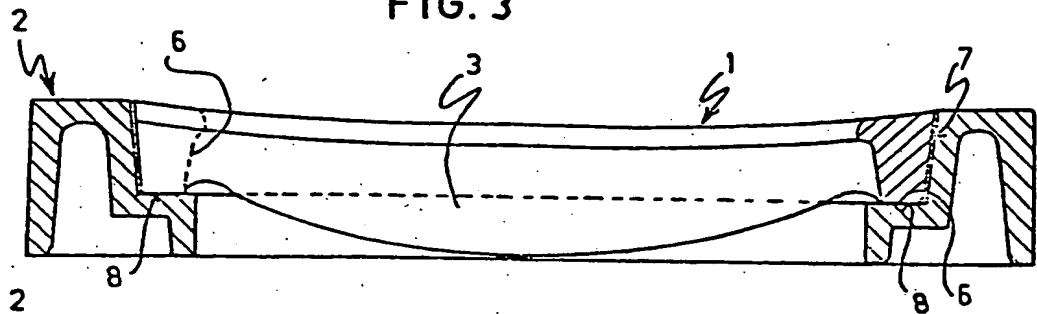


FIG. 5

